

# U.S. NAVY MEDICINE

October 1977



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# U.S. NAVY MEDICINE

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**COVER:** Not all Navy athletes are subject to the crushing blows of football, but every sport has its own physical stresses. Result: 864 sports-related injuries reported for Navy men and women last year. Beginning on page 4, CAPT Jay Cox (MC), director of sports medicine at the Naval Academy, tells Medical Department members how to care for and prevent these injuries. (Photo courtesy of Naval Academy Sports Information Office.)

# From the Surgeon General

## Hospital Corpsmen: They Deserve Better

THERE IS AN old saying that nothing is too good for our enlisted personnel and nothing is what they get. While not literally true, it's close enough to give us pause.

It is the skill, knowledge, hard work and dedication of the young men and women of the Hospital Corps that makes our system work. Without them we could not operate.

Lack of adequate numbers of ancillary personnel is among the reasons I most commonly hear for physicians wishing to leave the Navy. Every day letters and messages come across my desk concerning some shortage among our Hospital Corps community—operating room technicians, biomedical equipment repair technicians, laboratory technicians, and so forth. We train them and they leave us.

In the course of my travels I routinely meet with enlisted personnel. The concerns they express are the same almost everywhere. Many of these problems are beyond our control. But the most frequently expressed concern, and the one which distresses me most, is the apparent lack of communication between the Command and the staff.

I encourage regular meetings of Command and staff to improve communication. I have also directed that unnecessary watches be eliminated. And I have directed renewed

efforts toward patient education — to teach our patients that they have some responsibility for their own health care. These things will help.

We must make the lives of our enlisted personnel better. We can't increase their pay but we can certainly show we appreciate their service. When was the last time you recommended a hospital corpsman for a medal? When was the last time you said thank you?

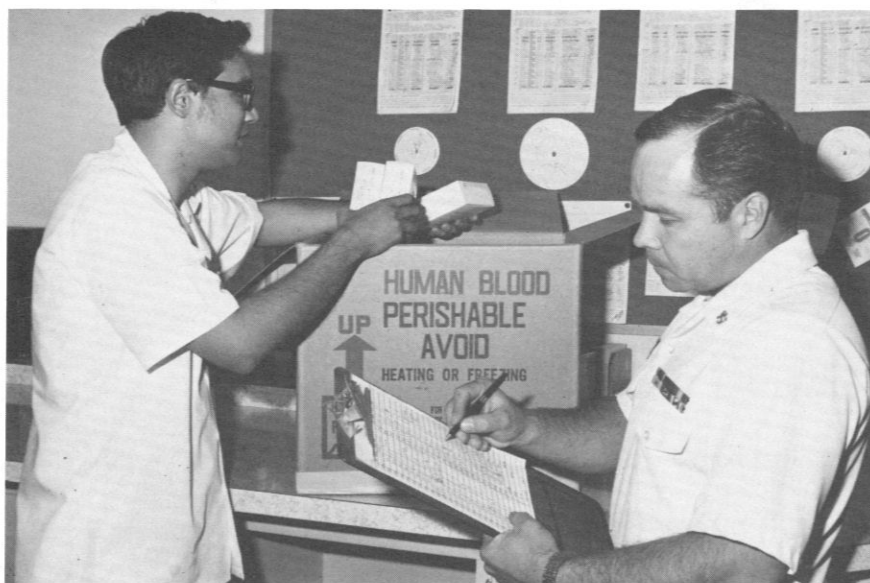
These young men and women **are** Navy medicine. They know it; let's let them know that we know it. For too long we have accepted their service as a matter of course. They deserve better!



W.P. ARENTZEN  
Vice Admiral, Medical Corps  
United States Navy



The Surgeon General talks with E-5's and below at NRMC Charleston, S.C.



Corpsmen pack frozen blood plasma for victims of airplane crash in Canary Islands

## Department Rounds

### Blood Program

# No. 635: License for Top Care

By the end of the year, all full-service Navy blood banks and blood donor centers in the U.S. will be licensed by the Food and Drug Administration.

LCDR James F. Bates (MSC), head of the Navy Blood Program, sees two major advantages: "First, licensure will allow us to exchange blood and blood components more freely and quickly with civilian blood banks. For example, for the first time we will be able to exchange blood with civilian blood banks across state lines, as we now do with other military blood banks."

"Second, by integrating certain aspects of the military blood program with the civilian program, we can help develop one nationwide system that will have uniform standards of quality and safety."

**Common policy.** According to LCDR Bates, the three-year journey toward licensure began back in June 1974, when the FDA and the

Department of Defense agreed to a common policy for licensing military blood banks under Section 351 of the Public Health Service Act. Each military service, it was agreed, would voluntarily apply to the FDA for a license to manufacture blood and blood components. The military departments also agreed to ensure that their licensed blood banks meet all prescribed standards and operate in accordance with FDA regulations.

While licenses granted military blood banks are the equivalent of civilian licenses, the FDA took into account DOD's unique defense mission: provisions were made to ensure the agreement would not compromise DOD ability to meet military requirements for blood.

The Navy's efforts to obtain licensure were carried out in two phases, the first beginning in November 1974.

"In Phase I, we obtained licenses

for our five regional blood coordinating centers," explains LCDR Bates. "We are now in Phase II, in which 13 other selected CONUS blood banks will be licensed."

Already licensed under U.S. License 635 are blood banks at Naval Regional Medical Centers San Diego, Portsmouth, Orlando, Camp Pendleton, Bremerton, Oakland, Long Beach, Great Lakes, Memphis and Newport, as well as at the National Naval Medical Center in Bethesda, the Naval Aerospace and Regional Medical Center in Pensacola, and Naval Hospital Beaufort, S.C. By 31 December, licensure is expected to be obtained for blood banks at NRMCS Charleston, Jacksonville, Philadelphia, Camp Lejeune and Corpus Christi.

**Inspections.** As LCDR Bates explains the procedure, commanding officers of each Navy facility selected for FDA licensure submitted an application for their facility and for each blood product. "The FDA then reviewed the applications and sent a representative to do a pre-licensure inspection," LCDR Bates says. "The FDA gave each facility a list of any discrepancies found during the inspection, and later the facility sent back to the FDA a letter explaining how each discrepancy was corrected." Only when the FDA was satisfied that a blood bank and all blood products manufac-

### RED BLOOD CELLS (HUMAN)

PREPARED FROM APPROX. 450 ml WHOLE BLOOD COLLECTED IN 63 ml ANTICOAGULANT CPD SOLUTION, U.S.P.

NO EVIDENCE OF IRREGULAR ANTIBODIES DETECTED WHEN TESTED WITH REAGENT RED BLOOD CELLS (HUMAN) BY MULTIPLE TECHNIQUES  
SEROLOGICALLY NONREACTIVE BY ART  
NONREACTIVE FOR HEPATITIS B SURFACE ANTIGEN BY RIA

### Rh NEGATIVE

WHEN TESTED FOR Rh, (D) AND WEAK Rh. VARIANT (D)

CAUTIONS:  
1. STORE WITHIN A 2 DEGREE C RANGE BETWEEN 1 AND 6 DEGREES C  
2. CROSSMATCH BEFORE TRANSFUSION  
3. IDENTIFY RECIPIENT AS PATIENT TO AVOID CROSSMATCH.  
4. DO NOT ADD MEDICATION TO BLOOD COMPONENTS  
5. MIX BLOOD THOROUGHLY AND DIAPHRAGM BEFORE USE.  
6. INFUSION SET MUST HAVE FILTER. DO NOT VENT  
7. SEE CIRCULAR FOR FURTHER INSTRUCTIONS.  
8. FEDERAL LAW PROHIBITS TRANSFUSION WITHOUT A PRESCRIPTION.  
9. WARNING: THE RISK OF TRANSMITTING HEPATITIS IS PRESENT IN ALL BLOOD COMPONENTS. IF HEPATITIS IS PRESENT IN THE DONOR, THE RISK OF TRANSMISSION IS NOT ELIMINATED BY ANY PROCESSING METHOD. ALL WARRANTIES IMPLIED ARE EXCLUDED.

ISOAGGLUTININ NOT DETERMINED

BUREAU OF MEDICINE  
AND SURGERY  
NAVY DEPARTMENT  
WASH., D.C. 20372  
U.S. LICENSE NO. 635



NAVAL REGIONAL  
MEDICAL CENTER  
BLOOD BANK  
SAN DIEGO,  
CALIFORNIA 92134

### New Navy blood bag label

U.S. Navy Medicine



tured there complied with FDA rules and regulations, would the command be permitted to use the common Navy license number on its blood and blood products.

According to LCDR Bates, Navy blood banks will be alerted in advance of pre-licensure inspections. Once licensed, however, they will be subject to unannounced annual inspections by the FDA, as well as inspections by representatives of the Bureau of Medicine and Surgery.

Licenses will be valid until suspended or revoked, or until military operations require deviation from FDA blood banking regulations. The Commissioner of Food and Drugs can recommend that a license be suspended or revoked if:

- FDA inspectors are unable to gain access to a facility.
- Product manufacturing has been discontinued to the point that a meaningful inspection cannot be made.
- The facility fails to conform to federal regulations.

A license will be suspended until the faults are corrected, and revoked if conditions are not put right within 60 days.

**Parity.** FDA licensure has already improved the Navy's Blood Program. Formerly, civilian blood banks in the State of California could not accept blood from Navy blood banks there because the Navy facilities were not licensed under California biologic laws and regulations. But ever since FDA licensure was obtained for most Navy blood banks in California, the situation has changed: the current stand is that, as federal enclaves exempt from California control, licensed Navy blood banks will be dealt with as are civilian FDA-licensed blood banks outside the state. So if a Navy blood bank is licensed by FDA to exchange across state lines, civilian blood banks in California can now accept its products.

Also, the American National Red Cross, which until now would not officially accept blood products from Navy facilities, is negotiating with

BUMED to develop a blood exchange program.

"These changes are the beginning of official recognition that will give the Navy's blood banks parity with the rest of the nation's blood banking organizations," LCDR Bates says. "This will make it easier for us to exchange blood with the civilian community, and help us manage our blood resources better. It may also help expand the CHAMPUS [Civilian Health and Medical Program of the Uniformed Services] blood credit exchange program in the Navy."

**Benefits.** FDA regulations imposing specific requirements for the safety, purity, and potency of blood and blood products have brought the Navy a number of benefits, LCDR Bates reports. For example, although the incidence of post-transfusion hepatitis is minimal in the Navy and the number of units of Navy-donated blood that contains hepatitis B surface antigen (HBsAg) is less than 1%, FDA regulations require more sensitive methods of HBsAg testing than the Navy was routinely using. "Navy blood banks in the U.S. are now screening all units of blood for HBsAg using methods of third-generation sensitivity," LCDR Bates reports. "With these procedures, we will be able to identify an increased number of blood donors who carry this specific hepatitis antigen. The result will be fewer incidents of post-transfusion hepatitis."

Better care for Navy patients is also assured by strict administrative controls called for in FDA regulations. For example, the FDA requires that there be a means of rapidly locating all components prepared from a unit of blood. LCDR Bates explains the importance of this requirement: "If after donating blood an individual is found to have a contagious disease, the unit of blood he donated and each component prepared from that blood can be traced to the recipient or to the place where the components are stored. We can also use these same tracking procedures to

notify donors that they might be ill, should a recipient develop a transfusion-related disease."

The FDA also requires licensed blood banks to monitor the quality of reagents, supplies, and techniques used to manufacture and process blood and components. While quality control has always been part of Navy blood bank procedures, the strict FDA regulations will ensure that maximum controls are imposed.

"These controls will require closer administrative supervision, and in some instances may increase the blood bank workload," LCDR Bates says. "But the benefits to our patients are worth the extra effort. We'll also be able to point to outstanding quality assurance measures should our blood program ever be involved in litigation."

LCDR Bates also believes that the common forms, records, blood bag labels and procedures required by the FDA will make it easier for Navy laboratory technicians to adapt to new duty assignments. "When all Navy blood banks are operating under common standards, the break-in period for new personnel will be minimal and there will be a smoother changeover of blood bank staff," he says.

Before licensure was sought, each Navy blood bank used its own blood bag labels—a practice unacceptable to the FDA. Now, a single style of label is used in all Navy blood banks in the U.S. Result: elimination of much of the confusion physicians and blood bank personnel previously encountered determining product names, transfusion precautions, blood groups, and other essential information.

"We can look for more benefits from FDA licensure," LCDR Bates predicts. "I think the annual inspections will give our regional area blood system coordinators greater awareness of problems within the Navy Blood Program. Also, tri-service cooperation will be improved when military blood banks and blood donor centers meet requirements for FDA licensure."



Contact sports such as football cause many injuries each year

## Interview

Down . . . ready . . . set . . .

# Hup-hup-hup! Oof! Thud! Hey, Doc!

Navy and Marine Corps athletes come in all shapes, sizes, and levels of competence—from Naval Academy midshipmen lauded on sports pages to desk-bound duffers who dream of breaking 100. Whatever their level of expertise, many who join in the games get hurt.

Statistics compiled by the Naval Safety Center, Norfolk, Virginia, show that naval activities last year reported 846 sports-related injuries:

**508** associated with ball games, including basketball, baseball, and football;

**18** from parachuting and gliding;  
**22** from winter sports, such as skiing, skating, and sledding;

**50** from water sports;

**248** resulting from other sports, including hiking, camping, bicycling, gymnastics, and wrestling.

Safety Center officials believe the number of injuries was probably much higher, since many minor injuries are not reported.

The records also reveal a more somber statistic: 51 sports-related deaths reported during 1976, most of them associated with water sports.

Because so many Navy and Marine Corps men and women take part in sports, Medical Depart-

ment members—especially hospital corpsmen serving on independent duty—may find it helpful to know something about sports medicine. Prompt treatment of injuries—or better yet, proper conditioning of all participants—can help reduce the number of man-days lost each year due to athletic wear and tear.

*U.S. Navy Medicine* asked CAPT Jay S. Cox (MC), director of sports medicine at the Naval Academy and chief of the Orthopedic Department at Naval Hospital, Annapolis, for pointers on preventing and treating sports injuries.

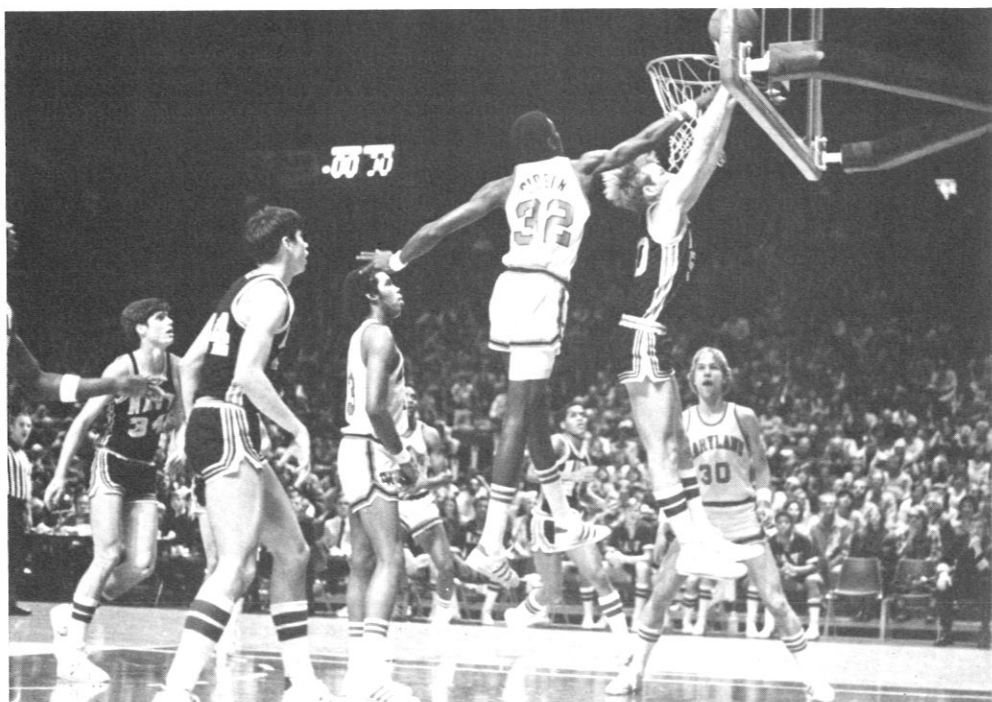
**USNM: CAPT Cox, how did you get involved in sports medicine?**

This interview was conducted by CDR Douglas W. Peterson (MC), a staff member at the Bureau of Medicine and Surgery.



**Tennis elbow can result from overexertion of forearm extensor muscles**

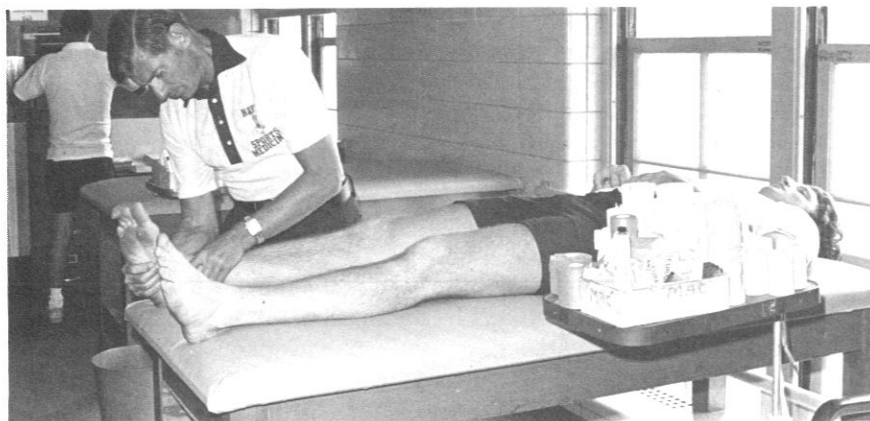
**CAPT Cox:** I was originally interested in children's orthopedics in the days when many children still had residual effects from polio. After the vaccines eliminated most of the polio problems, my interest switched to sports medicine. I served as team physician for the Capital Bullets basketball team in 1966 when they were still in Baltimore. Later I was associated with the Oakland Raiders while I was stationed at Naval Hospital Oakland, and served as their assistant orthopedic consultant from 1970 through 1972. Since 1974 I have been chief of orthopedics at Naval Hospital Annapolis and director of sports medicine at the Naval Academy. I am also the team physician for varsity football, basketball, lacrosse, and baseball. My two associates in the Orthopedics Department cover the many other athletic teams at the Academy.



**Many injuries are associated with fast moving games such as basketball**



**Stress syndromes of lower legs plague joggers (left) and other Navy athletes**



**Dr. Cox examines athlete's ankle in Naval Academy's training room**



**Did you have any formal training in sports medicine?**

No, at that time there was no formal training in sports medicine. I learned through the school of hard knocks—through experience, reading, and sharing colleagues' experiences. There are now some fellowships available in sports medicine.

**What injuries are especially common in sports?**

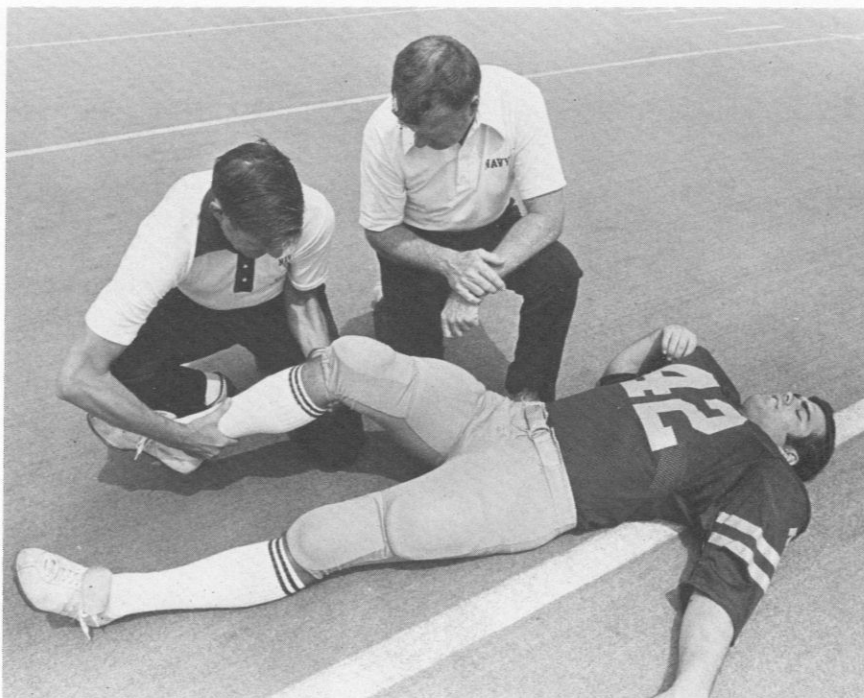
Stress syndromes of the foot, ankle, and lower leg are common, especially in the running sports such as jogging. Many of these injuries occur from running on hard surfaces, such as the heavy steel decks on Navy ships. When the foot is subjected to stress, there can be problems such as tendinitis, heel pain, ankle pain, shin splints, and stress fractures. Sometimes the stress is transmitted to the knee and is reflected by soreness and tenderness, particularly around the kneecap.

One of the commonest stress syndromes is pain along the longitudinal arch of the foot. This occurs when an athlete comes down hard on the longitudinal arch. Good supportive shoes are probably the best way to prevent this type of injury.

**You mentioned stress syndromes of the ankle. Are there different kinds of ankle sprains?**

Approximately 15% of ankle sprains are the eversion or outward-twisting type. This is the most serious and devastating type of non-fracture ankle injury, and it requires early treatment by a physician.

The other type of ankle sprain, comprising about 85% of ankle ligament injuries, is the inversion, plantar flexion type of sprain. This is the injury that occurs when a basketball or volleyball player twists the foot and ankle inward. The ligaments on the outer aspect of the ankle are stretched or torn. This type sprain should be treated vigorously, particularly during the first few days; the more vigorous the immediate treatment, the less disability results.



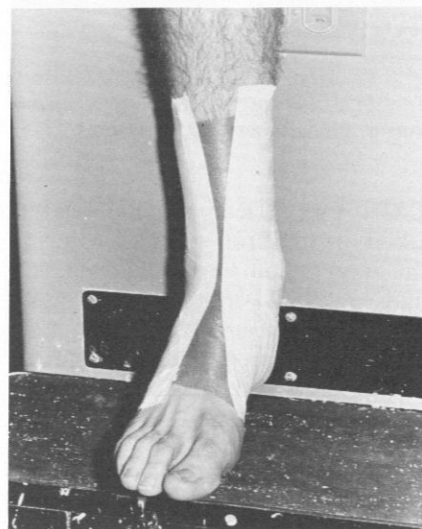
Dr. Cox and "Red" Romo (right), head trainer at Naval Academy, examine injury

**What is the best first-aid?**

The foot should be elevated immediately and ice should be applied. Then the ankle should be taped in the neutral position to reapproximate the ligaments. Later the patient should be encouraged to walk with crutches to "pump" the edema from the ankle region. The worst way to treat an ankle sprain is to ignore the injury and allow the athlete to "walk it out." If the initial injury is not treated properly, there may be recurrent sprains and frequent disability.

**How should ice be applied to ankle sprains?**

Immersing the injured ankle in ice water immediately after the injury is the best method to obtain vasoconstriction and discourage swelling. Ice packs applied to the ankle are also effective. The first thing we do for someone at the Naval Academy who has sprained an ankle is to immerse the ankle in an ice whirlpool for 30 minutes. Then the ankle is wrapped in tape—a compression-type wrap with an open front allowing room for swell-



Properly taped ankle. Note opening in front to allow for swelling

ing is used initially. The patient can remove the tape if it becomes too tight. We encourage the patient to keep the foot elevated and to apply an ice pack over the tape as often as possible for the first 48 hours. Each day the sprained ankle is unwrapped for another whirlpool treatment. We use the ice-water whirlpool for the first three days and then



switch to alternating cold and hot whirlpool treatment. This contrast bath or "cold-hot" treatment causes alternate vasoconstriction and vasodilation, which decreases edema around the injury.

### What are shin splints?

That's a catch-all term for various stress syndromes of the lower leg. For instance, there can be a stress fracture of the tibia itself. Pain in the anterior or lateral muscle compartments from swelling of the muscles can also be called shin splints; there is irritation and swelling of the muscle fibers, and the compartment in the lower leg becomes tight and painful. Another type of shin splint is a periostitis or irritation of the covering of the tibia, usually on the anteromedial aspect.

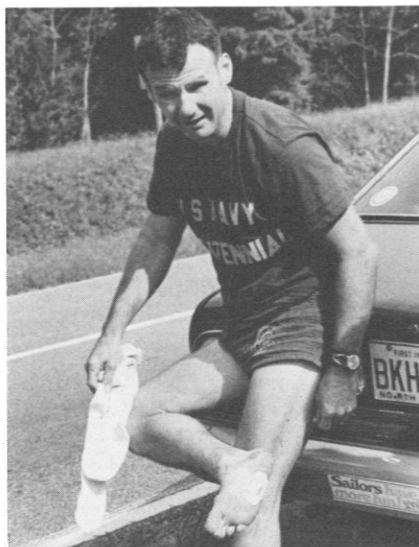
Another stress syndrome is tendinitis, or inflammation of the tendons that mobilize the foot. The irritation usually occurs at the musculotendinous junction and causes lower leg pain which is often called "shin splints."

### What's the best overall treatment for stress injuries to the foot and lower leg?

The stress that is causing the problem must be decreased. If the athlete doesn't want to stop all running, the pace should be slowed to the point where pain ceases. With heel pain or longitudinal arch strain, pain can be relieved by putting a piece of soft rubber sponge or felt in the heel of the shoe. Also, a good supportive running shoe will help prevent or alleviate this problem.

In many of these stress syndromes, the athlete has an imbalance of the muscles around the foot. The most common imbalance is tight heel cords. By simply stretching the heel cords, many stress syndromes can be eliminated. This is the single most important prevention and treatment for the conditions I mentioned previously as shin splints.

Another treatment that will help is applying pads to various parts of



**Felt pads help supinate foot and prevent shin splints in runners**

the foot. For instance, a small, L-shaped felt pad, 1/4-inch thick, under the first metatarsal head and along the shaft of the first metatarsal is an excellent way to treat shin splint syndromes. The pad supinates the foot slightly, relieving some stress.

### Are oral enzymes effective in treating sprains, contusions, and other swelling injuries?

It has not been proven that oral enzymes have any effect on swelling injuries, so they are not used here at the Naval Academy. Most people in sports medicine say that if enzymes are used, they should be injected into the site of injury—but this practice is seldom used any more.

### Are some people more prone than others to stress syndromes of the lower leg?

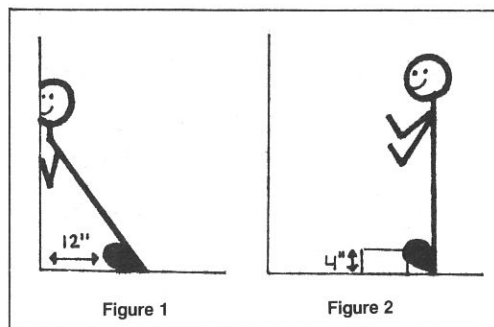
Yes. If someone not used to activity begins to jog at too rapid a pace or in too advanced a program, he will subject himself to these stress syndromes. Well-conditioned athletes seldom get the syndromes unless there has been a change or break in training.

### How can someone condition himself to prevent stress syndromes?

Heel cord stretching exercises are very effective. You stand 12 inches from a wall and lean forward, putting your chest against the wall without raising your heels from the floor [Figure 1]. If this can be done easily, the position should be held for about ten minutes; as the heel cords stretch, less pull is felt and the distance from the wall can be increased. This exercise should be done two or three times a day.

Another way to stretch heel cords is to stand for ten minutes with your heels on the floor and your forefeet on a book approximately four inches thick [Figure 2]. The more often you do this, the greater the benefit.

It's important for an athlete to perform heel cord stretching exercises after he has sustained an injury and hasn't been participating in athletic activities. If a cast or tape has immobilized the foot or ankle, the Achilles tendon [heel cord] has become tight and needs stretching.



Another type of effective exercise to prevent injury is the "lateral step-up." This is a relatively simple exercise, but it's excellent for strengthening all muscles of the lower extremities and trunk. People with knee or ankle injuries can use it as a means of rehabilitation. It can be performed anywhere, so it's appropriate for the Navy where individuals are on different training exercises while on duty—at sea, for example.

The step-up exercise is performed using a block, 6 inches high, placed against a wall so you can't lean and decrease the workload on the extremity. If such a block is not available, this exercise can be performed

on any stairstep. Place one foot on the block and the other foot parallel on the floor, with the toes approximately at the instep of the foot on the block. Using the leg on the block, raise your body until full extension of that knee is obtained, then go back down to the original position. Lift off and land on your heel to avoid toe push off.

When first starting lateral step-ups, the foot on the floor should be approximately 4 inches from the foot on the block. As strength increases, the distance can be extended to 12 inches and, if possible, the height of the block can be increased to 12 inches. There's no reason to go higher than 12 inches.

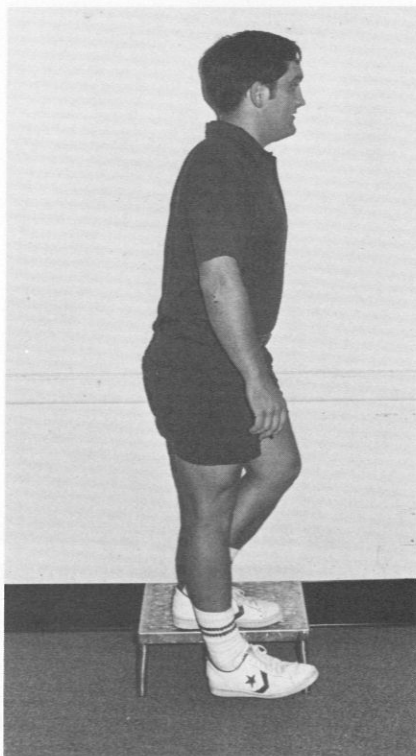
It is important to do this step-up exercise for a certain period of time, and *not* for repetitions. The exercise is done for three minutes per leg, three times a day, and is gradually increased to five minutes per leg, five or six times a day.

#### **What type of knee problems are athletes likely to develop?**

Other than the stress-related injuries, most knee problems will be acute injuries. A common injury occurs while the athlete's foot is planted on the ground and the body turns in the opposite direction, resulting in a twisting force applied to the knee. The athlete feels a sudden pain, sometimes accompanied by a pop or click which could mean injury to a knee cartilage, the kneecap, or even one of the knee ligaments. The immediate first-aid is to minimize weight-bearing and apply ice to the injury. Ace bandages should not be used—they offer little support and constrict the knee area, impeding the circulation returning from the calf. Such knee injuries should be evaluated by a physician as soon as possible.

#### **Why do some people hear a grinding noise when they do knee-bends?**

Grinding or crackling noise coming from a joint is called crepitus. This is caused by a portion of one bone moving on another bone. In



**Trainer HM2 Ross Langston demonstrates lateral step-up exercise**

most cases, crepitus is normal—like cracking your knuckles. It's significant only when it's painful, which may mean there is irritation between the bony surfaces. This is most common between the kneecap and the femoral condyles behind the kneecap.

Patellar or kneecap pain often occurs when a person is going up and down stairs or ladders, or running up and down hills. People who have such pain should avoid stairs, and



**Dr. Cox demonstrates neck examination**

run on soft surfaces and level ground. Incidentally, running downhill causes many more stresses than running uphill.

#### **Why are hamstring muscle pulls so common?**

The hamstrings are decelerators of the legs, so a hamstring muscle may be torn when someone is running fast or sprinting and over-stretches these powerful muscles. The important thing to remember when any muscle is torn is that healing time cannot be hurried.

Treatment is aimed at decreasing the inflammatory reaction around the muscle by applying ice packs for the first two or three days after the injury. Then ice massage is started. A paper cup filled with water is put in the freezer to harden into an ice-block. The patient can take this ice-block from the freezer, peel off some of the paper, and massage the injured muscle area. We encourage the patient to stretch the torn muscle very gently while using the ice. The ice helps in two ways: it decreases the inflammation and it numbs the area so the injured muscle can be stretched and allowed to heal in this stretched position. If someone walks around with the knee flexed, the muscle will heal in a shortened position and is prone to reinjury as soon as hard running is attempted. When ice massage and stretching are used, the muscle takes the same time to heal but it heals in the elongated position and will seldom be reinjured. After the muscle has completely healed, the patient should do several flexibility exercises and gradually work back into a training program so other muscles are not injured.

#### **Is this same treatment good for pulled groin muscles?**

Yes. Muscle pulls around the groin usually involve the hip flexors or hip adductors. These injuries also respond well to ice and limited activity. Again, it's important for the patient to perform flexibility exercises before getting back into full training.



**Dr. Cox treats shoulder dislocation. Trainer assists by applying countertraction**

**In contact sports, we often hear about "hip pointer" injuries. What are they?**

This is a common name for a contusion directly over the iliac crest. This area is very vulnerable to direct trauma because the iliac crest is close to the skin and has little natural padding. A direct blow can injure the subcutaneous tissue as well as the muscle attachments. Although not serious, this is a very painful injury. It responds well to ice and limited activity.

**What other contusions occur in athletics, and what are the dangers?**

A contusion of the thigh musculature occurs from a direct blow to the front of the thigh. The injury results when the anterior thigh strikes another object with considerable force. There is usually immediate pain and swelling in the area, and often a large hematoma forms as a result of bleeding into the muscle. As with other muscle injuries, if this injury is not treated properly the thigh will be prone to reinjury.

The hematoma occasionally becomes calcified. This condition is

called myositis ossificans and can be very disabling because of limited range of motion of the knee. To prevent this problem, a thigh contusion should be treated as soon as possible with ice to decrease bleeding and swelling. The patient should avoid flexing the knee for the first 48 hours to prevent further tearing or damage to the muscle. Heat should never be applied to a thigh contusion during the first five days.

**How does a shoulder dislocation occur and what is the best way to treat this injury?**

This is a common injury, usually caused by a stress that forces the arm upward and backward. The most common type of shoulder dislocation is an anterior-inferior dislocation, which is accompanied by tremendous pain and spasm in the shoulder muscles.

To reduce the dislocation, the patient must relax. We seldom use narcotics at the Naval Academy, but we have found that a 10 mg injection of Valium, given intramuscularly or preferably intravenously, will afford sufficient relaxation to reduce

a dislocation in even the most muscular individual.

The simplest way to reduce a dislocated shoulder after the injection is to pull the arm straight out from the body. While an assistant holds the patient flat on the table, traction is applied in the longitudinal direction. As the patient relaxes, the arm is gradually abducted to the 90° position and then slightly higher. Usually as this position is reached, the head of the humerus will slide back into place.

Another way to reduce this dislocation is to place a foot in the patient's armpit and apply traction in the longitudinal direction. Again, an assistant can apply countertraction. In this reduction the foot serves as a fulcrum, allowing the head of the humerus to gently slip back into the socket. The reduction should be gentle, without application of force, to avoid fracturing a bone. Independent duty corpsmen should try to reduce such injuries if there is no evidence of a fracture, because shoulder dislocations are acutely painful and it may be some time before the services of a physician can be obtained.

Another common injury to the shoulder in sports is a "shoulder separation." This injury to the acromioclavicular joint can occur if an athlete falls directly on the point of the shoulder. The pain is located directly over the acromioclavicular joint, and may be accompanied by a marked upward prominence of the distal clavicle. The only treatment necessary for this injury is immobilizing the arm in a sling for comfort and administering analgesics for pain. There is no urgency in locating a physician because only the third-degree or complete dislocation is sometimes treated surgically.

**What about bursitis of the shoulder?**

We seldom see an actual bursitis in athletes. True bursitis is the inflammation of a small sac between the rotator cuff and the acromial process of the scapula. The more



common shoulder condition—sometimes called “bursitis”—is actually a tendinitis of one of the several tendons of the rotator cuff. This condition is aggravated by abduction of the arm. When the arm is raised, the rotator cuff tendons are brought under the acromial ligament, which is a thick band that can impinge on the tendon and cause the inflammation.

To cure this type of tendinitis, the patient must avoid abduction of the shoulder joint. Sometimes, to see if the tendinitis is improving, the patient will move his arm in circles. This further irritates the tendon. The patient should be told that the tendinitis will last at least seven days and that the arm should not be raised until the tendon heals. Often this limitation of movement, aided by a sling, will get rid of the problem. If the condition persists, the patient should see a physician.

#### **Would you discuss “tennis elbow”?**

Tennis elbow is an inflammation that occurs on the medial or lateral epicondyle of the humerus. The common form is on the lateral epicondyle at the origin of the extensor muscles of the forearm. The problem is caused by overexertion of these extensor muscles; tenderness is found directly on the point of the outside elbow. Medial epicondylitis results from an irritation at the origin of the flexor muscles of the forearm; its point of tenderness is on the medial point of the elbow. Both types of tennis elbow are commonly seen in racket sports, throwing sports, and even in bowling.

Once again, the condition is treated by decreasing the patient's activity and applying ice. A commercially available elastic strap that fits around the forearm decreases mechanical pressure on the origin of the muscles and helps alleviate the problem. A physician can give oral anti-inflammatory medications to speed healing.

These elbow problems are seldom seen in athletes younger than 25. As tennis players become older, they

have decreased speed and reflexes. More forearm and wrist motion is used in the swing of the racket to compensate for poor body position and more stress is applied to the muscle origins at the elbow.

#### **What about finger and thumb injuries?**

An athlete will often dislocate one of the finger joints in many sports activities. The proximal interphalangeal joint is most frequently dislocated. When this happens, you can see a marked deformity of the finger. Traction applied in a longitudinal direction will usually reduce the dislocation. It's my opinion that after any such injury X-rays should be taken to rule out chip fracture or

a combined fracture dislocation. These injuries should then be evaluated by a physician.

#### **You haven't mentioned heat as a treatment for sports-related injuries.**

It's an old wives' tale that we treat acute injuries with heat. All injuries should initially be treated with ice. One thing for which heat is used is an infectious type process such as an abscess or cellulitis. Heat may also be used to alleviate muscle spasms caused by strains of the neck or shoulder muscles. But if the spasms result from an acute injury, such as a pulled or contused muscle, ice should be used for the first 48 hours before heat is applied.

## **More About Sports Medicine**

Want to know more about sports medicine? Here are some resources you may find useful:

- “Medical Evaluation of the Athlete . . . A Guide,” published by the American Medical Association, is aimed at physicians who care for athletes. Topics covered include proper conditioning, good coaching, capable officiating at sports activities, proper equipment and facilities, and adequate health supervision. There is a detailed description of how to do a complete health checkup on athletes, a chart of conditions that disqualify a person from participating in sports, and a poster describing first aid for sports injuries. The booklet costs 80¢ and can be obtained from the Order Department OP-209, American Medical Association, 535 North Dearborn Street, Chicago, Illinois 60610.

Also available from the Order Department are several other AMA publications on recent developments in sports medicine. Ask for a list:

- The National Registry for Football Head and Neck Injuries, established by Temple University School of Medicine in Philadelphia, collects data on serious football injuries. The information is offered to athletic associations and other interested groups to support rule changes that would protect the head and spinal column from undue abuse in football games.

- Lenox Hill Hospital in New York City runs an Institute of Sports Medicine and Athletic Trauma, headed by James A. Nicholas, M.D. An interview with Dr. Nicholas published in *U.S. News and World Report* (29 December 1975) contains useful information on sports injuries.

- Several medical problems related to athletics are discussed in a special Olympic Games issue of the *Journal of the American Medical Association* published 12 July 1976. This issue has articles on enlarged hearts in distance runners, gaining and losing weight, health care for women athletes, and exercise-induced asthma.



## NOTES

## ROSTER – 1 SEPTEMBER 1977

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NAVAL DISEASE VECTOR ECOLOGY AND CONTROL CENTER, JACKSONVILLE, FLA .....	OIC CDR S.A. WHITE, MSC, USN AO LT B.R. FORO, MSC, USN
EIGHTH NAVAL DISTRICT .....	DMO CAPT P.C. GREGG, MC, USN (ADDU) DDO CAPT E.L. HOFFIUS, DC, USN (ADDU)
NAVREGMEDCEN, CORPUS CHRISTI, TEX .....	CO CAPT J.R. LUKAS, MC, USN DCS CAPT D.W. PEACE, JR., MC, USN DAS CDR G.W. BALDAUF, MSC, USN CH NURSE CAPT M. DONOGHUE, NC, USN
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CH NURSE CAPT L. PETERSON, NC, USN

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DAS CAPT J.J. PALMER, MSC, USN  
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DAS (VACANT)  
CH NURSE CDR L. NICKERSON, NC, USN



# NAVMED Newsmakers

"Hey, I like the looks of those new Navy uniforms," thought the pretty blond beaming at the bright flowers and pointed hat sported by LT **Kevin Kerrigan**, MC, USNR on his visit to the NRMC Camp Lejeune Dependents Clinic. Then she got an eyeful of HM2 **Jerry Hillin**.



Hillin (left), Kerrigan & admirer

"Wow, some beard! The Navy's really getting with it. Maybe if I wish hard they'll bring back bell bottoms." Funny about those Halloween wishes . . .

She's a familiar character on TV: the spunky young mother, working and raising a family by herself, "One Day At a Time," through the joys and trials of "Alice" and "The Partridge Family." She's a familiar character at NRMC San Diego, too. Only there she's HM2 **Janet McDowell**, former assistant leading petty officer for the dependent primary care clinic and now assigned to the center's Military Personnel Office.

On the job she oversees the check-in process for all enlisted Medical Department members reporting to the regional medical center or its outlying clinics. At home she guides an energetic 10-year-old son, James. And because she's also a licensed vocational nurse and a member of the California Fire Rescue and Paramedic Association, HM2 McDowell spends some of her free time as an emergency medical technician.

"Knowing I've been able to help people is the biggest reward I get as a hospital corpsman," she says.

CDR **Joan Bynum** (NC) didn't expect to see her name on the latest list of staff corps captain selectees: she hadn't realized she was even in the selection zone. But her selection gave her a sure place in Navy history as the first black woman to wear the coveted four gold stripes.

At NRMC Great Lakes, CAPT-selectee Bynum is nursing coordinator for the coronary care unit, general medicine and infectious disease wards, newborn nursery, and postpartum ward. When asked about her professional goals, the 19-year

Navy veteran replies, "I'm happy to take whatever the Navy sends my way."

It was a relaxed summer day in Okinawa—perfect for a trip to the pool. And the three Navy hospital corpsmen, busy with a Red Cross water survival lesson, fit right in with all the other swimmers and sunbathers. Suddenly, a crisis: the kind that shows why hospital corpsmen deserve their reputation for excellence. A man sitting at the pool's edge fell backwards, gasping for breath. Marine Corps SSGT Robert Faye rushed to his side and began resuscitation. He was quickly relieved by HA **Steven Morse**, HM2 **Duane Curtis** and HM3 **Terrance Pair**, who alternately provided artificial resuscitation and life-supportive first aid. After about half an hour the victim had recovered enough to be taken to a hospital. For this noteworthy act of mercy, the rescuers received a Red Cross Certificate of Merit and accompanying pin. This is the Red Cross's highest award for people who save a life using skills learned in Red Cross first aid, small craft, or water safety training programs.



HM2 McDowell: 'I've been able to help'



CAPT-selectee Bynum: First for four

## Off Duty

# Meet Dr. All Thumbs

Dr. All Thumbs takes her clowning seriously. But the laughter she invokes isn't heard in a circus tent: instead, it rings through the wards of Naval Regional Medical Center San Diego, where ailing and sometimes critically ill children are cared for.

HM3 Venita E. Patterson has that rare type of creative talent which sometimes just overflows into her work. As "Dr. All Thumbs," a certified clown, she combines her entertainment skills with her health care training, using her comical antics to ease the sometimes apprehensive young patients.

**Jesting.** Whether she's jesting at a picnic for children stricken with leukemia or entertaining in a crowded clinic waiting room, HM3 Patterson simply likes making people laugh.

"I think a lot of times the way you approach a child determines your rapport with him," she says. "If you're jolly and joke with him, he starts to relax a little and think, 'Hey, this person isn't so bad after all.'"

"You have to know how to read kids, because you can really scare them. You have to learn how to explain things in simple terms so they can understand, and you have to go about your work in a calm manner."

HM3 Patterson says she has always wanted to be in medicine: "Ever since I was small, the health field fascinated me. I did a lot of volunteer work in occupational therapy when I was a student in New Mexico—over 300 hours—and I got my start there in emergency rooms.

"But I've always wanted to be a clown, too. I am one, anyway. I've been a clown without makeup for many, many years. Finally I decided

to go one step further and get the makeup."

HM3 Patterson joined the Navy in 1975 to help support her mother who suffers from glaucoma and cataracts. She was also interested in educational benefits: before joining, she spent three semesters at the University of New Mexico at Albuquerque, working part-time to cover expenses.

**Opportunity.** After completing Hospital Corps School at Great Lakes, Ill., HM3 Patterson was assigned to NRMC San Diego, where working in the emergency room gives her the diversification she likes.

"I have to have a lot of change in my life," she says. "I like working in the emergency room because it never gets boring."

The opportunity to become a professional clown presented itself by accident, HM3 Patterson says. She happened to see graduation ceremonies for "clownology" majors at San Diego State University, and decided she just had to do it herself.

To attend the university's last scheduled 18-week course in clownology, the 21-year-old petty officer got special permission to work at night in the emergency room. The Navy also paid for three-quarters of her tuition under the Tuition Aid Program.

"In school we learned how to put on the makeup and all about costuming," she says, her expression animated. "We designed our own face, our own costume, and character. I took the name of Dr. All Thumbs because most kids who come into the emergency room are really apprehensive and scared—anybody in white scares them."

"So I figured I'd be a doctor-type clown. I'd wear white and put some



Dr. All Thumbs coaxes a smile

patches on, so the kids wouldn't associate bad things with people in white."

Her insistence on creating a costume that would help the children at work didn't sit well with her instructor, who had a more traditional view of the colors of clownery.

"He didn't like it at all," HM3 Patterson remembers. "He said I should color my lab coat pink or some other color. But I told him that I work with kids. When children walk into the emergency room they're petrified. That's why I left my coat white—to try and lessen the fears they have."

Although she's never worked a full day in her clown outfit or worn it while performing any antiseptic chores, HM3 Patterson has gone into the emergency room and entertained, sometimes using puppets as animated examples for children.

Occasionally, she also will drop by the Pediatric Clinic when it's busy, go out into the lobby and clown around for a while, to make the children's waiting time a little more enjoyable.

**Variations.** When not at the medical center, HM3 Patterson spends



**HM3 Patterson with young patient: "The emergency room never gets boring"**



**Dr. All Thumbs gets a big hug**



**HM3 Venita E. Patterson**  
"The children make it worthwhile"

part of her spare time with the Clownology Alumni Association at Scripps Cottage on San Diego State University campus. There are 60 paid members, including one woman in her 70's. Members must complete a probationary period before being voted into the club.

"You just can't walk in off the street wanting to be a clown and slap on some makeup," HM3 Patterson says. "All the people here are pretty well into it professionally."

She explains that there are three variations of clowns to choose from when a student decides on a particular face and personality: the tramp, like Emmett Kelly; the white

face, or more serious Ronald McDonald type; and the august, exaggerated buffoon.

"The august is the real comedian," HM3 Patterson says. "In school we experimented with each type of makeup until we found something that we liked and that matched our personality. It's a very individual thing."

Her association with the alumni

club together with two courses in magic from two San Diego magicians has helped land her some small jobs. She performs at children's birthday parties, small get-togethers, business promotions, grand openings, and was recently invited to perform at the San Diego Junior Chamber of Commerce Spring Festival.

**Real success.** As the most rewarding event in her clowning career, HM3 Patterson remembers an Easter picnic for pediatric hematology patients. "There were about 15 children and parents down at the hospital chapel," she recalls. "The children ranged from little babies to 12-year-olds. They didn't know that I was coming—all they knew was that there would be a surprise."

"It was really neat, because the kids were just thrilled. We had lunch, an Easter egg hunt, and I made balloons for all of them and put on a magic show. The picnic was a real success."

"I knew that some of those children were dying, and it was satisfying to think that I brought a little bit of happiness into their lives. Any time I can do something like that, or make a hospital visit, it's always worthwhile. Any joy I can bring the children makes it worthwhile."

Although HM3 Patterson says her future is as uncertain as her zany and unpredictable capers as a clown, she does hope to stay in the health care field. She credits her Navy experience for giving her a chance to grow.

"It's helped out a lot financially, given me time to think, and also the time to do justice to home and family," says the young hospital corpsman. "I've had more time to plan, an opportunity to save money, and the chance to do some traveling."

HM3 Venita "Dr. All Thumbs" Patterson can best be described in the words she chose for her business cards: "Behind all smiles and frowns of clowns are people who love."

—Story by John Brindley. Photos by PH2 Bob Weissleder.



# Scholars' Scuttlebutt

## Taxes: What's in Store for AFHPSP Students?

Under the provisions of Public Law 94-454 of 4 Oct 1976, students who entered the Armed Forces Health Professions Scholarship Program (AFHPSP) on or after 1 Jan 1977 are subject to federal income tax withholding. Students who entered the AFHPSP *before* 1 Jan 1977 are not subject to federal income tax withholding for calendar years 1976, 1977, 1978 and 1979. However, *all* AFHPSP students will be subject to withholding during calendar year 1980 and thereafter.

Legislation to exempt AFHPSP students from federal income tax has been introduced in both the House and the Senate. As of 1 Sept 1977, three bills had been submitted to the House Ways and Means Committee: HR-5190, introduced by James Jones (D-OK); HR-7944, introduced by William Natcher (D-KY); and HR-7993, introduced by Timothy Carter (R-KY). In the Senate, Sen. Wendell Ford (D-KY) and Sen. Walter Huddleston (D-KY) have submitted S-1698 to the Senate Finance Committee.

As the situation now stands, most new AFHPSP students will experience a severe cut in their first monthly stipends. This is because all federal income tax due on 1977-78 academic year tuition payments made in calendar year 1977 must be withheld from the three or four monthly stipend checks these students will receive in 1977. In calendar year 1978, federal income tax withholding will be spread over the entire calendar year—except for students who enter the AFHPSP late in 1978.

Recent discussions with the Navy Finance Center in Cleveland indicate that the following formula will be used to calculate a student's gross monthly income subject to withholding:

$$X = \frac{T}{(M-1)} + \$400$$

Where

X = Gross monthly income subject to federal income tax withholdings.

T = Estimate of tuition and fees to be paid to the school during the calendar year.

(M-1) = Number of months in a taxable year adjusted for one 45-day active-duty for training (ACDUTRA) period.

\$400 = Unadjusted stipend payment.

The "T" value in the above formula is a function of the school's billing cycle and reflects when, during a particular calendar year, the student came into the program. For

example, most students come into the program during the last half of a calendar year when most schools commence their academic year. If the school bills the Navy for the entire upcoming academic year, the "T" would equal one full year's tuition and fees. On the other hand, if the school bills by the semester, the "T" would equal half of one full year's tuition and fees. In the case of students whose participation in the program spans an entire calendar year, "T" would always equal a full year's tuition and fees.

The "M" value is entirely a function of the number of months during a calendar year that a particular student is a member of the program.

TABLE I. Monthly Tax Table to be Used for Stipend, Tuition and Fees

SINGLE					
IF WAGE IS:			TAX WILL BE:		
Not over \$142			-0-		
Over	But not over				
\$ 142	\$ 329			16% of excess over \$ 142	
329	621	\$ 29.92	+	18%	329
621	788	82.48	+	22%	621
788	954	119.22	+	24%	788
954	1288	159.06	+	28%	954
1288	1538	252.58	+	32%	1288
1538		332.58	+	36%	1538
MARRIED					
IF WAGE IS:			TAX WILL BE:		
Not over \$263			-0-		
Over	But not over				
\$ 263	\$ 454			15% of excess over \$ 263	
454	965	\$ 28.65	+	18%	454
965	1204	120.63	+	22%	965
1204	1538	173.21	+	25%	1204
1538	1871	256.71	+	28%	1538
1871	2204	349.95	+	32%	1871
2204		456.51	+	36%	2204



The following example may serve as a guide for students who wish to estimate their tax liability and resulting monthly stipends:

Program entrance date:

September 1977

School billing cycle: Semester

Tuition estimate: \$4,000 per year

Marital status: Single

Unadjusted stipend: \$400

1) Find the gross monthly income subject to withholding (X):

$$X = \frac{T}{(M-1)} + \$400$$

$$X = \frac{\$2000}{(4-1)} + \$400$$

$$X = \frac{\$2000}{3} + \$400$$

$$X = \$667 + \$400$$

$$X = \$1067$$

2) Use the tax table in Table I to determine tax liability on gross monthly income. In this example, tax liability is \$190.70 (\$159.06 + 28% of excess over \$954).

3) Subtract the tax liability (\$190.70) from the monthly stipend to find the amount that will appear on each monthly check. In this case, the student would receive \$209.30 each month (\$400 less \$190.70).

Since new AFHPSP students enter the program at various times throughout a given month, their first stipend check will reflect money granted for a partial month less the amount withheld for federal income tax. Therefore, students who enter the program late in the month would receive a very small check, or possibly no check at all. All subsequent checks will reflect a full month's stipend payment (\$400) less the amount withheld for federal income tax. Also remember that the "M" value will change to 12 in January 1978 for students who entered the program during the current calendar year.

Federal income tax will also be withheld from a student's claim for reimbursement. In this instance,

14% of the reimbursable expense will be deducted as federal income tax. This deduction will be taken each time a reimbursement claim is submitted.

Near the end of each year, the Naval Health Sciences Education and Training Command will provide the Navy Finance Center with a list of the *actual* tuition costs for each student subject to federal income tax withholding during the calendar year. The finance center will use this list to compute actual gross income for annual W-2 statements.

## BUMED SITREP

**PHOTOS AND BIOGS . . .** The Chief of Naval Personnel requires all officers on active duty, whether USN or USNR, to submit official photographs and biography sheets at certain times during commissioned service. BUMED also has a continuing need for updated photographs and biography sheets of Medical Department officers, to keep files current and for use in considering various assignments and training.

COs of BUMED-commanded activities are requested to bring the provisions of BUPERS *Manual* article 5020140 to the attention of all members of their command, and to direct compliance in updating official records by submitting photographs and biography sheets. Copies should be submitted to cognizant corps codes in BUMED as follows: Medical Corps—Code 31; Nurse Corps—Code 32; Dental Corps—Code 613; Medical Service Corps—Code 711; Physician's assistants—Code 31.

**STAFF PLANNING COURSE . . .** The Landing Force Training Command Pacific conducts medical staff planning courses at the Medical Inservice Training Section, First Marine Division, Camp Pendleton, Calif. This one-week course offers 35 hours of classroom instruction in medical aspects of amphibious operations, primarily at the landing force level. Subjects include: introduction to amphibious operations; amphibious task force organization and command relations; embarkation planning; logistics planning; medical estimates; casualty estimates; medical support of the landing force; combat medical sup-

Sometime near the beginning of each calendar year, students will receive a W-2 statement reflecting gross income for the previous calendar year based on stipend, tuition, and fees. Other W-2 statements reflecting income from reimbursables and ACDUTRA will have been issued earlier during the calendar year: W-2 statements reflecting reimbursables are issued with each reimbursement check; statements reflecting ACDUTRA are issued at the completion of the training period.

ply/authorized medical allowance lists; and development of the medical annex.

A few openings in this course are available to Medical Department officers serving in or ordered to billets involving medical support to Fleet Marine Force elements. Information on class schedules and quotas may be obtained from the Division Surgeon, 1st Marine Division, FMF, Camp Pendleton, Calif. 92055. Phone: (Area code 714) 725-3521/4744; Autovon 993-3521/4744.

**CONTINUING EDUCATION ACCREDITED . . .** The Naval Health Sciences Education and Training Command has been accredited by the Northeast Regional Accrediting Committee of the American Nurses Association for a period of four years as a provider of and approval body for continuing education in nursing.

This accreditation permits continuing education recognition to be awarded participants in Medical Department nursing continuing education programs which meet acceptable national standards. Such recognition may be applied toward state requirements for individual relicensure.

**AUDIT TIPS . . .** Commands may wish to review the following recommendations from a Navy Audit Service report:

- Record and tag all Class 3 plant property items and dispose of excess Class 3 plant property, as required by NAVCOMPT *Manual*, par. 036304-2.
- Perform triennial inventories of Class 3 plant property, in accordance with NAVCOMPT *Manual*, par. 036208.

## Safety Tips

# Nonflammable Medical Gas Systems

CDR John P. Swope, MC, USN  
BUMED, Code 416

Previous "Safety Tips" have addressed the use of medical gases in such patient care areas as anesthetizing locations and respiratory therapy areas. This article will concern itself with the piping systems of nonflammable medical gas systems (piping systems are not used with flammable gas).

Nonflammable medical gases include but are not limited to oxygen, nitrogen, nitrous oxide, medical compressed air, carbon dioxide, helium, and mixtures of such gases when used for medical purposes. Although oxygen and nitrous oxide are nonflammable gases, they provide an oxidation substance that accelerates the combustion process.

An important requirement for nonflammable medical gas systems is oxygen compatibility. National Fire Protection Association (NFPA) Standard 56F requires that all elements of a medical gas system be compatible with oxygen. This includes not only the deterioration of materials when exposed to oxygen, but also materials that may be easily ignitable—such as oil.

In NFPA 56F, there are two separate constraints: the first constraint is to maintain sources of supply for patient care; the second, to minimize associated hazards in the operation, installation and testing of medical gas systems.

## SOURCE OF SUPPLY

**Cylinder systems.** Two sources of gas supply allowed under NFPA 56F are a cylinder system without reserve supply, and a cylinder system with a reserve supply. Each cylinder system shall be composed of two separate banks of cylinders which supply gas to the pipeline. These cylinders shall be so arranged that when one bank is depleted the system automatically switches to the second bank. Banks must be large enough to hold several days' supply unless delivery schedules are so infrequent that a greater supply must be maintained. There shall be a check valve arrangement in these systems to ensure that when one bank is depleted, it will

not deplete the other bank. This cylinder system with reserve supply shall have, in addition to the above-mentioned two banks, a reserve supply which shall operate automatically in the event that both the primary and secondary supplies are unable to supply the pipeline. The reserve supply shall consist of three or more manifolded high-pressure cylinders.

Cylinders used in the medical nonflammable gas system shall be designed, constructed, tested, and maintained according to Department of Transportation specifications and regulations. The pressure in these nonflammable medical gas systems shall be between 50 and 55 pounds per square inch gauge (psig) at all outlets. The pressure-regulating equipment shall be capable of maintaining a minimum flow rate. Nitrogen medical gas systems shall be capable of delivering at least 160 psig to all outlets at maximum flow.

**Storage.** This standard sets forth pressure relief valve requirements within the storage area for nonflammable medical gas systems to ensure that pressure will not build, without relief, to such a point that the pipeline bursts. The room where supply systems are stored shall have lockable doors or gates, and shall not be used to store anything other than nonflammable gas cylinders. Empty cylinders may be stored in these enclosures. To prevent damage, electrical wall fixtures in these rooms shall be installed in fixed locations not less than five feet above the floor. Storage rooms located within a building shall have a two-hour fire rating as stated in the NFPA 220 Standard, "Types of Building Construction." Smoking shall be prohibited in these enclosures. The rooms shall be heated by steam, hot water or other indirect means. Cylinder temperatures shall not exceed 130° F.

**Air compressors.** Medical air compressors shall be kept separate from the cylinder gas systems or storage enclosures. The compressors shall take their source of air from the outside atmosphere and shall not add contamination in the form of particulate matter, odor, or other gases. Compressors shall be oil free; equipped with an intake filter-muffler of the dry type, after

cooling, or an air dryer; and have a downstream pressure-reducing regulator. These devices ensure that the system will add no contamination to the medical compressed air provided for the patient. Antivibration mountings shall be installed, in accordance with the manufacturer's recommendations, under these air compressors, and flexible coupling shall interconnect the air compressor, its receiver, intake lines, and the supply lines from the storage receiver.

**Piping systems.** NFPA 56F also discusses pipeline systems, and sets forth criteria for materials and techniques used to construct pipelines. All pipelines shall be identified with the name of the gas contained. The standard describes how the system shall be protected against physical damage, and includes guidance for protecting buried pipeline systems and pipelines which could be damaged from bumpings with carts, stretchers, trucks, and so forth.

**Shutoff valves.** The pipeline system shall have shutoff valves, accessible only to authorized personnel; the valves shall be installed in boxes with frangible or removable windows large enough to permit the valves to be operated by hand. Each valve shall be labeled with the name of the gas it supplies and the area to which the gas is provided.

**Station outlets.** Each station outlet for the gas shall be equipped with either a hand-operated or automatic shutoff valve legibly labeled with the name of the gas. Each station outlet shall have a noninterchangeable connection (either a diameter index safety system or a female member of an approved noninterchangeable quick coupler appropriate for the medical gas service). Each medical gas delivery line that services an anesthetic apparatus through a yoke insert shall have a check valve installed in the line immediately adjacent to the yoke insert; this check valve will prevent backflow from the small cylinder that is attached to the same valve and that holds medical gas under high pressure. This arrangement will minimize the possibility of accidental rupture of the connecting hose and piping systems should it be necessary to open the small cylinder in an emergency.

Station outlets in patients' rooms shall be located approximately five feet above the floor or in a recess; this will help avoid damage to the valve or control equipment—such as sometimes occurs when humidifying bottles are attached, for example.

**Warning systems.** There shall be two warning systems to monitor the function of the pipeline system. Both shall be supplied by normal and emergency electrical power systems. The first warning system is the operating alarm which sounds just before or at the time of changeover from one bank of cylinders to another. The emergency alarm system will sound when the supply system is not functioning properly and shall be actuated by any of the following conditions: low or high pipeline pressure, operation of reserve supply, or loss of reserve supply.

## INSTALLING AND TESTING SYSTEMS

In the final chapter of NFPA 56F, installation and testing of pipeline systems are discussed. All piping valves and fittings except those furnished by the manufacturer as especially prepared for oxygen service and received sealed shall be thoroughly cleaned of oil, grease, and other readily oxidizable materials by being washed in a hot solution of sodium carbonate or trisodium phosphate. Scrubbing shall be employed, when necessary, to ensure complete cleaning; after washing, the material shall be rinsed thoroughly in clean hot water. Particular care shall be exercised in storing and handling pipes and fittings. Tools for cutting or reaming the pipelines shall be kept free from oil or grease. Where such contamination has occurred, the items affected shall be rewashed and rinsed after installation of the piping, but before installation of the valve outlets. All the lines shall be blown clean with oil-free dry air or nitrogen.

**Pressure testing.** After it is installed, the system shall be pressure-tested with oil-free dry air or nitrogen using a pressure of 1-1½ times the maximum working pressure, but not less than 150 psig. Tests shall be maintained until each joint has been examined for leakage using soapy water or another equally effective means of leak detection that can be used safely with oxygen.

**Standing pressure test.** The pressure may be allowed to change only with a temperature change. The formula for allowable pressure change is given in this standard.

**Cross connection test.** To determine that no cross connection to other pipeline systems exists, all systems shall be reduced to atmospheric pressure and all sources of test gas to all systems shall be disconnected. Then each system shall be pressurized individually and each outlet checked to assure that only that system is pressurized. The other outlets shall also be checked to make sure there is no cross connection. Prior to operation, all outlets shall be opened to purge and flush the pipeline system; afterwards, the outflow from each designated and labeled medical gas outlet station shall be tested to confirm the presence of the designated gas. An oxygen analyzer shall be used to confirm that the oxygen is of the desired purity. All medical gas pipeline systems shall be tested after each alteration or repair of the system to assure that only the gas for which the system is designated is being used.

## SUMMARY

This has been a brief summary of the NFPA standard for nonflammable medical gas pipeline systems. By following the guidelines for installation and testing, many tragedies that have occurred could have been avoided.



# Instructions and Directives

## Financing "productivity enhancement" projects

NAVCOMPT Instruction 7000.38 sets forth Department of the Navy policy with respect to financing productivity enhancement/fast payback capital investment opportunities, and establishes procedures for identifying items, funding, and follow-up reporting. All projects of a commercial or industrial nature must undergo cost analysis. Projects which do not fully meet requirements for in-house operations cannot be submitted. A copy of this cost analysis must be included in the project file and retained at the local level.

Productivity enhancement projects identified at naval medical activities shall be submitted via BUMED Code 463. All projects submitted shall be included in the investment equipment budget for the facility.—BUMED Instruction 7000.5 of 14 June 1977.

## Medical/dental and subsistence rates, and hospital bills

The full reimbursement rate for hospital care provided non-U.S. citizen employees of the U.S. at overseas activities is now \$168 per day. The full outpatient rate for these individuals is \$20.

No charge will be made for newborns while the mother is hospitalized. If the infant remains after the mother is discharged, the rate prescribed for the mother will apply except for infants of active-duty personnel and ex-service maternity patients. In those instances, the infant will be charged the dependent rate.

As a general rule, only one charge will be levied per patient per day regardless of the number of outpatient visits recorded or ancillary services provided. No charge will be made for outpatient visits which result in the patient's admission to the hospital the same day.

The full outpatient rate covers medical and dental outpatient care provided civilians employed by the U.S., as well as their dependents, when payment is made by the patient or insurance carrier and not the patient's sponsoring agency. This rate includes physical examinations for domestic help. Note that free emergency "on-the-job" medical care is provided civilian employees through the Federal Employee Health Program.—BUMED Notice 6320 of 15 June 1977.

## Medical/Dental Equipment Maintenance and Repair Manual

To ensure optimum equipment readiness, a maintenance and repair program for medical and dental equipment will be carried out with maximum practicable use of inservice organizational resources. Provisions of the Medical/Dental Equipment Maintenance and Repair Manual, applicable to all Navy and Marine Corps activ-

ities having medical or dental personnel assigned (including medical and dental departments of the operating forces), shall be implemented promptly.

Report MED 6700-19 is cancelled. Also, BUMED Instruction 5101.3 and NAVMED 5101/1, Electric Bed Inspection Form, are cancelled.—BUMED Instruction 6700.36A of 17 June 1977.

## Navy Acute Minor Illness Clinic Program

Naval medical facilities shall review their patient screening programs and use of Hospital Corps members as primary care screeners to determine whether a Navy Acute Minor Illness Clinic Program is required. If such a need is identified, guidelines for a standardized program may be obtained from the Naval Health Sciences Education and Training Command, Bethesda, Md. 20014.

When developing NAMIC Programs, these policies shall apply:

- NAMIC personnel should be E-3 or E-4 hospital corpsmen (HM-0000).
- Billets must come from current resources, and should be titled "clinical assistant (NAMIC)."
- The limited NAMIC Program may be developed consistent with HSETC guidelines. [NOTE: The full capacity program is under review; availability will be announced.]—BUMED Notice 1510 of 24 June 1977.

## Blood donor centers and transfusion services

Each Navy health care facility is responsible for establishing rules and regulations governing the selection of suitable blood donors, collection and processing of whole blood or blood components, selection of compatible blood for the recipient, and proper procedures for administering blood. Minimum procedural requirements are set forth in the enclosure to BUMED Instruction 6530.6C of 15 July 1977, and in the references listed in that instruction.

## Practical Comptrollership Course

The two-week Practical Comptrollership Course at the Naval Postgraduate School, Monterey, Calif., is designed for military and civilian personnel who hold or are about to assume responsible positions in financial management. The course helps students acquire the skills and knowledge they need to serve as comptroller, assistant comptroller, accounting officer, budget officer, or head of the internal review staff.

Travel and per diem costs will be funded by BUMED beginning in FY78. Commands shall submit the name, grade or rate, Social Security number, and position title of personnel nominated to attend this course to BUMED Code 46A, by the nomination deadline.

Class dates (nomination deadlines in parentheses) are: 5-16 Dec 1977 (25 Oct 77); 13-24 Mar 78 (25 Jan 78); 5-16 Jun 78 (25 Apr 78).—BUMED NOTE 5300 of 4 Aug 1977.

# Notes & Announcements

## DENTAL CONTINUING EDUCATION COURSES

The following dental continuing education courses will be offered in January 1978:

### *National Naval Dental Center, Bethesda, Md.*

Oral pathology 9-13 Jan 1978  
Removable partial dentures 23-25 Jan 1978

### *Eleventh Naval District, San Diego, Calif.*

Removable partial dentures 9-11 Jan 1978  
Oral pathology 23-27 Jan 1978  
Maxillofacial prosthetics 30 Jan-1 Feb 1978

### *U.S. Army Institute of Dental Research, Walter Reed Army Medical Center, Washington, D.C.*

Oral surgery 9-12 Jan 1978

Requests for courses administered by the Commandant, Eleventh Naval District, should be submitted to: Commandant, Eleventh Naval District (Code 37), San Diego, Calif. 92132. Applications for other dental continuing education courses should be submitted to: Commanding Officer, Naval Health Sciences Education and Training Command (Code 5), National Naval Medical Center, Bethesda, Md. 20014. Applications should arrive six weeks before the course begins.

Cross-country travel and travel from outside the continental U.S. to attend dental continuing education courses generally will not be approved due to funding limitations.

## NURSE CORPS CONTINUING EDUCATION COURSES APPROVED

The quarterly meeting of the Nurse Corps Continuing Education Approval and Recognition Program (CEARP) review board convened in July 1977 at the Naval Health Sciences Education and Training Command, Bethesda, Md. The following 43 continuing education programs were approved for the contact hours indicated in parentheses:

### *NRMC Portsmouth, Va.*

Critical Care Nursing (60)

### *NRMC Charleston, S.C.*

Leadership and Management Training Course (80)

### *NRMC Jacksonville, Fla.*

Coronary Care Course (ROCOM) (80)  
Fire Emergency in a Patient Care Facility (4)  
Basic Life Support (Cardiopulmonary Resuscitation) (8)  
Current Aspects of Maternal-Child Health (30)  
Ostomy Care (2)

### *NRMC Great Lakes, Ill.*

Precepts on Dying (12)

### *NH Patuxent River, Md.*

Patient Contact Point Training Curriculum (6)

### *NRMC Corpus Christi, Tex.*

Basic Life Support (Cardiopulmonary Resuscitation) (4)  
Intravenous Certification Program (4)

### *NRMC Oakland, Calif.*

Basic Cardiopulmonary Resuscitation (6)  
Hypertension—A Symposium for Nurses (30)

### *NH Whidbey Island, Oak Harbor, Wash.*

Nursing Today (3)  
Communication Skills Workshop (6)  
Prepared Childbirth—The Lamaze Method (3)

### *NRMC Memphis, Tenn.*

Basic Life Support (Cardiopulmonary Resuscitation) (10)  
Patient-Oriented Medical Records (4)  
Care Plans (7)  
Recognition of Arrhythmias (60)  
Insertion of an Intravenous Teflon Catheter Placement Unit (8)

### *NRMC New Orleans, La.*

Care of the Ostomy Patient (2)  
Physical Assessment: Lungs and Thorax, Abdomen, and Heart (6)

### *NSMC Groton, Conn.*

Coronary Care Nursing (48)  
Nursery Care Course (27)  
Care of the Patient with Cancer of the Breast (2)  
Care of the Patient with Severe Preeclampsia and Resultant Renal Failure (2)  
Care of the Patient with Respiratory Dysfunction (2)  
Care of the Patient Undergoing Renal Dialysis (2)

### *NRMC Camp Pendleton, Calif.*

Critical Care Course (60)  
Management: Human Relations/Performance Evaluation (24)  
National Critical Care Course (60)  
Auditing the Nursing Process: The Question of Accountability (5)

### *NRMC Camp Lejeune, N.C.*

Basic Coronary Care (35)  
Nursing Assessment and Problem-Oriented Patient Care Planning Workshop (8)  
Advanced Renal Care (4)  
Basic Renal Care Course (4)  
Basic Orthopedic Care (4)

### *NARMC Pensacola, Fla.*

Intensive Care Unit Course (80)

### *NRMC Newport, R.I.*

Oncology: An Overview III (1.5)  
Intravenous Certification Program (4)  
Basic Life Support (Cardiopulmonary Resuscitation) (6)

### *NNMC Bethesda, Md.*

Physical Assessment of the Adult Chest and Thorax (2)

Nurse Corps officers interested in attending one of these courses should request a quota from the host command.

Accreditation of the Navy Nurse Corps CEARP by the Northeast Regional Accrediting Committee of the American Nurses Association precludes retroactive approval of offerings. Programs should be submitted for review 30 days before first presentation date.

## Clinical Notes

# Cannulating Wharton's Duct During Biopsy

CAPT Edward L. Mosby, DC, USN

Oral surgeons often perform biopsies of lesions on the floor of the mouth near the ducts of the submandibular gland. When excisional biopsy is indicated, there is always a danger of inadvertently or unknowingly severing one or both of Wharton's ducts. I will describe a simple way to locate the submandibular ducts during surgery and to ensure that they will be patent at the end of the procedure.

### TECHNIQUE

The following items are needed to cannulate a submandibular duct: lacrimal dilators in sizes 1, 2, and 3; lacrimal probes in sizes 00 through 6; and a 14-18 gauge intravenous catheter.

Local anesthesia is accomplished so as not to distort the tissue to be removed for biopsy. The duct orifice is located, dilated and probed with successively larger lacrimal probes up to the size 6 probe. Salivary flow is checked and the catheter sutured into position. (Both submandibular ducts can be cannulated for midline lesions.) During the surgical procedure, an assistant can hold the catheter to the side, ensuring a clear field of vision for the biopsy and closure. If the oral surgeon is concerned that duct patency may be reduced or obliterated during healing, the catheter may be left in place after the operation and checked periodically for patency and salivary flow.

If a portion of the duct is removed with the tissue specimen, the catheter may be used to position the new duct orifice. This catheter should be left in place for 10 to 14 days or until epithelialization is complete. The catheter may be removed after the wound closes and healing progresses without complications.

CAPT Mosby is an oral surgeon on the staff of the Dental Service, Naval Regional Medical Center, Great Lakes, Ill. 60088. He thanks PH2 R.M. Smith and the Fleet Training Center photographic laboratory, Naval Station San Diego, for their assistance with this article.



Typical midline floor of mouth lesion, visually obscuring submandibular ducts.



Above left: Both ducts are cannulated and retracted. The lesion could be excised without repositioning the ducts, since it does not actually involve them. Right: The wound has been closed with catheters still in place.



Surgical area one week after surgery. Note that ducts are closer together, but both are patent.



# Hypertension Screening Aboard Ship

LCDR E. Wayne Massey, MC, USNR

The arbitrary value of 150/90 has generally been accepted as a definition of hypertension—a "silent disease" that produces no symptoms until it is well advanced and considerable damage has occurred. Under the 150/90 standard, as many as 15% of U.S. men in their 30's and 20% of men in their 50's can be considered hypertensive (1). But some scientists believe that optimal blood pressure for adults may be below 120/80, and that increased mortality may result with elevations of only 10 to 20 millimeters of mercury (2). Also, blood pressure is known to rise with increasing age until around the age of 60, when the blood pressure may be 140/90.

All these facts make the task of defining hypertension more difficult, but do not lessen the importance of defining, controlling and preventing this disease.

Elevated blood pressure may lead to coronary artery atherosclerosis and cerebral atherosclerosis (3). Cerebral artery aneurysms are more common in hypertension (1), as are changes in renal parenchyma, heart muscle, vessel walls and other organs. Although most hypertension is diagnosed as "essential," or unknown, blood pressure elevations may be caused by increased release of renin from the kidney, increased renin substrate (such as may occur during pregnancy or in women taking contraceptive steroids), and primary increases in aldosterone

from adenomas, hyperplastic adrenal glands, or other forms of adrenal pathology. The value of blood pressure control in reducing the incidence of strokes and heart failure is well established, and early diagnosis and treatment of hypertension is recognized as an important part of preventive medical care.

Hypertension is not a rarity in childhood, as physicians once thought. Some studies have revealed that 6% of young people from age 1 day to 18 years may have hypertension (4); among youths aged 12 to 24 years, as many as 11% may have the disease (5,6). Examination for hypertension should not be overlooked when physicians treat these young patients.

## SHIPBOARD SCREENING

Because hypertension can so easily go undetected, especially among young people, we undertook blood pressure checkups for the 454-man crew of the USS *Trenton* (LPD-14) during the ship's return from a Mediterranean cruise. The value used to screen the men was 140/90—in conformance with the *Manual of the Medical Department*.

We also checked the men's weight, and recommended diet and exercise for overweight members.

Eleven sailors were found to have elevated blood pressures (four others were known hypertensives already being treated). In followup, 3 of these 11 men had lower blood pressures than on their initial check, and they were advised to have periodic checks over the next year. The other eight men had continued elevated blood pressure and were referred to the Hypertension

Clinic at Naval Regional Medical Center Portsmouth, Va., for evaluation, counseling, and medication as needed. The men's ages ranged from 18 to 37 years, and the highest blood pressure was 180/120. Some of these men may eventually drop back to a "normal" blood pressure range, but they will all continue to need frequent checks.

This type of shipboard screening program would be a success if only one man was diagnosed as hypertensive and the course of his disease altered, but to identify so many previously unknown problems was unusually rewarding. Including the already known hypertensives, the prevalence of hypertension on board a Navy ship with a crew of "healthy young men" was a remarkable 2.7%.

Other ship medical departments may wish to undertake this type of relatively easy and rewarding blood pressure screening program.

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LCDR Massey is on the staff of the Neurology Service, National Naval Medical Center, Bethesda, Md. 20014. At the time this article was written, he was participating in the Fleet Medical Pool Program as medical officer in the USS *Trenton*.

# The Efficacy of the CMI and MMPI as Predictors of Successful Completion of Psychiatric Technician Training

LT John J. Penkunas, MSC, USN  
CAPT John F. McGrail, MC, USN

Escalating costs and high attrition rates associated with the Navy's various training programs have been the concern of many investigators. Arthur's comprehensive article (1) reviewed the various techniques that have been employed to minimize attrition rates in such programs. Some investigators have used personality tests and medical scales, as well as "odds for effectiveness" scores, to predict the successful completion of training. For example, in 1972, Biersner (2) found that a special subscale of the Cornell Medical Index (CMI), when combined with the Physical Fitness Scales, was a useful predictor of successful completion of the Navy's Underwater Demolition Training Program. In the civilian sector, early investigators found that two psychological tests—a revised Beta Examination and a Multiple Choice Rorschach—satisfactorily differentiated the "definitely good" group from the "definitely bad" group of psychiatric aides training at Connecticut State Hospital (3).

The psychiatric technician school at Naval Regional Medical Center Philadelphia provided an excellent opportunity to study factors possibly relevant to an individual's ability to successfully complete an extensive and demanding psychiatric technician training program. This program began training hospital corpsmen in April 1949, and graduated its final class in July 1976; the Navy then entered into a tri-service psychiatric technician training program in which the academic portion is coordinated at a training center in San Antonio, Tex., and

the clinical experience is provided later at certain Navy psychiatric residency training centers.

In the earlier psychiatric technician training program, Navy psychiatrists, psychologists, psychiatric nurses, and enlisted instructors provided students with both lectures and clinical training. The primary objective of this four-month intensive program was to enable students to acquire the principles, skills and techniques they needed to be effective psychiatric technicians. To successfully complete the program, students had to maintain a satisfactory academic average as well as demonstrate certain clinical skills on the wards. The psychiatric courses, close preceptorship and clinical experience were all designed to help the students develop various positive, therapeutic characteristics—including tolerance, flexibility, compassion, and an objective, rational approach to a patient's problems.

A potential psychiatric technician trainee must be a volunteer who has had no appreciable administrative or disciplinary difficulties; the candidate must have successfully completed a basic Hospital Corps School course in general medical/surgical patient care, and have a combined GCT-ARI score of 105. A medical/psychiatric screening interview is sometimes required. Psychological testing has not, to date, been a regular part of screening applicants for Navy psychiatric technician training programs.

We undertook this study to determine whether the Minnesota Multiphasic Personality Inventory (MMPI) and the Cornell Medical Index (CMI) would be useful in predicting which students would successfully complete the academic and clinical instruction required of psychiatric technician trainees. The null hypothesis states that there are no significant

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differences between the test scores of the disenrolled and the graduated groups of students. We hope that our research might provide an adjunctive tool for screening and selecting Navy psychiatric technician training program candidates.

## METHOD

All 39 students comprising the last three classes of psychiatric technician trainees served as subjects for the study. Before each class began, every student was administered the MMPI and the CMI.

The MMPI is an extensively used "objective" personality test which has ten empirically constructed clinical scales and three validity scales designed to assess the subject's test-taking attitude. The MMPI asks the subject to make a self-report on 566 items dealing with religious, political, and sexual attitudes, general health, mood, interests, pre-occupations, and abnormal experiences (4).

The CMI is a self-administered instrument which requires the subject to report on 100 items concerning various neuropsychiatric and psychosomatic symptoms. The CMI has been used repeatedly as a valid indicator of both general health and emotional stability in a variety of populations and cultures (5).

To avoid the pitfalls of self-fulfilling-prophecy type phenomena such as described by Rosenthal (6), we used a "blind" design. Numbers, rather than the students' names, were placed on test materials. Neither the researchers nor the psychiatric technician school faculty could relate test results to the identity of the subjects. The psychiatric nursing supervisor who held the list of students' names and assigned numbers did not have access to the test materials (which were kept by the junior author). Also, the psychiatric nursing supervisor was not associated with the psychiatric technician school, and therefore could not influence the students' success or failure.

Each MMPI was computer-scored by a national service; the CMIs were scored by the junior author.

Two groups of subjects—those graduated and those disenrolled—were formed after the commencement exercises of each class. There were 30 subjects in the graduated group and 9 subjects in the disenrolled group.

## RESULTS

Statistical analyses of the data (T-tests, see Table I) showed that the graduated subjects differed significantly from the disenrolled group on the CMI and

**TABLE I. A Comparison of Differences of Mean Scores of Disenrolled and Graduated Groups**

Scale	Disenrolled Group vs.	
	Graduated Males	Graduated Both Sexes
<b>Validity Scales</b>		
L	.989	.744
F	1.594	1.733
K	3.903**	3.836**
<b>Clinical Scales (K-corrected)</b>		
Hs	.368	.171
D	.626	.686
Hy	1.269	.468
Pd	.542	.698
Mf	.199	NA
Pa	1.130	1.282
Pt	.228	.0789
Sc	1.359	1.666
Ma	2.529*	2.654*
Si	.504	.384
	df = 32	df = 37

\*\* .01 level (2 tailed)

\* .05 level (2 tailed)

two MMPI scales: the K scale (sometimes referred to as a correction or "suppressor variable" scale), which measures the degree of conscious or unconscious defensiveness in the subject's test-taking attitude; and the Ma or "hypomanic" scale, which measures the personality factor characteristic of overproductivity in thought and action (7,8). The disenrolled group scored in the pathological direction on these three scales.

On the MMPI, the graduated group's mean K score was 19.46, which is equivalent to a T-score of approximately 64; the disenrolled group's mean K score was 14.66—or a T-score of 54. Such a difference suggests that the disenrolled group had a more self-critical test-taking attitude than did the graduated group. Although the K scale is affected by the subject's socioeconomic and educational background, there were no significant differences between the two groups on these variables.

On the Ma scale, the graduated group's K-corrected mean score was 21.10—equivalent to a T-score of 61 and well within the normal range. However, the disenrolled group's mean score on the Ma scale was 25.22—in the pathological range since it is equal to a T-score of 71. From such a difference the



inference can be drawn that some persons in the disenrolled group were troubled by an overproductivity of thought and action. People with high Ma scores often get into trouble because they undertake too many projects and soon lose interest in them. Such people have been described as overtalkative, distractible, and restless. Corpsmen with such traits would not be good candidates for psychiatric technician training, which requires workers to make many rational judgments while providing care for psychiatric patients.

On the CMI, the disenrolled group's mean score was 10.11, whereas the graduated group's mean score was 4.00 ( $p < .01$ ,  $t = 3.965$ ,  $df = 37$ ). The disenrolled group gave positive answers to items concerning various psychosomatic and anxiety-type complaints 2.7 times more frequently than did subjects in the graduating group. The elevated mean score of the disenrolled group approximated the mean score of the people on whom the CMI was standardized in 1948—people who had serious neuropsychiatric and psychosomatic disturbances (9). If CMI scores of 13 and higher were used as a cutoff point, the attrition rate would have been 19%, which is not a major improvement over the 23% attrition rate that occurs when no psychological tests are used (Table II). In other words, there were statistically significant differences between the mean scores of the disenrolled and graduated subjects but no practical differences between the groups, since no cutoff score would have markedly improved the attrition rate.

Table II shows how certain cutoff scores would have reduced the attrition rate for the psychiatric technician trainees we studied. In the table, cutoff scores are arranged in an increasing order of effectiveness. The most effective combination of cutoff scores—the

K and Ma scales of the MMPI—would have eliminated three students from the disenrolled group but none from the graduated group.

## DISCUSSION

The null hypothesis was rejected because there were statistically significant differences between the test scores of the graduated and disenrolled groups. Moreover, if cutoff scores were selected from the scales on which the groups differed to a statistically significant degree, dramatic changes in the attrition rates would be realized.

An attrition rate of 23% prevailed for the last three Navy psychiatric technician training classes, in which the standard MMPI and CMI were not used to screen students before they began training. Our research suggests that selecting students based on MMPI scores of 28 and higher on the Ma scale and 14 and lower on the K scale would have reduced the attrition rate to 8%. Stated differently, with this selection criteria only 1 of 12 students would have been disenrolled, rather than 1 of 4.

The CMI proved to be a statistically valid screening device in our study, although it did not compare with the apparent immediate practical application of the MMPI. We postulate that if a larger number of subjects were studied, useful predictive CMI scores might be developed.

In 1976 Booth and his associates (10) reported a 27% attrition rate for the Hospital Corps "A" School\*. These investigators uncovered a variable work-role motivation which would have reduced that attrition rate to 13%. They concluded that Navy enlistees who elected to work in the paramedical field were more likely to complete training than were enlistees who did not have a strong preference to serve in that field.

All the psychiatric technician students we studied were essentially volunteers who had completed Hospital Corps "A" School. However, since June 1970 the attrition rate for the psychiatric technician school at NRMPC Philadelphia has been 26%. Booth's findings that volunteers were more successful than non-volunteers in completing paramedical training programs suggest that a much lower attrition rate should have prevailed, notwithstanding the especially demanding aspects of such training.

\*Hospital Corps "A" School essentially consists of 14 weeks of lectures and practical training in the fundamentals of anatomy and physiology, pharmacy and toxicology, preventive medicine, first aid and emergency treatment, and nursing procedures.

**TABLE II. Psychiatric Technician School Attrition Rate as a Function of Cutoff Scores from Psychological Test Scales**

Cutoff scores	Attrition rate	Students eliminated	
		Disenrolled group	Graduated group
None used	23%		
CMI (13 and higher)	19%	2	1
Ma (28 and higher)	14%	4	1
K (14 and lower)	13%	5	3
Ma (28 and higher) and K (14 and lower)	8%	3	0

We postulate that the difference between the actual attrition rate among Navy psychiatric technician trainees and the rate that might have been expected is related to the especially complex factors that enter into an individual selecting this particular type of training. To function proficiently as a caregiver in a Navy psychiatry setting, the prospective psychiatric technician must be essentially free of serious psychological disturbance when he or she enters the training program.

## CONCLUSION

In this study, we tested the validity of the assumption that to the extent a corpsman chooses psychiatric technician training for reasons having to do with unresolved and unrecognized conflicts, psychological testing should be useful in detecting evidences of such predominately unconscious motives. Our findings support the belief that psychological test screening would be a useful adjunct in selecting individuals for this training program.

If our study can be replicated, volunteers selected for psychiatric technician training would have a greater chance of successfully completing the program; candidates unlikely to succeed would not be selected for training, and would thus be spared the emotional stress of failure. Such screening could be conducted at the prospective trainee's duty station, and individuals with scores at or near the cutoff point could be considered more closely before being selected for psychiatric technician training.

With the advent of tri-service training for military psychiatric technicians, and the attendant provision of the didactic experience in one geographic location and the clinical experience at a different location, the need for improved screening procedures and associated cost savings will probably be greater in the future than it is now.

## SUMMARY

This study used a blind research design to assess the usefulness of employing the MMPI and CMI as adjuncts to screening volunteers for Navy psychiatric technician training. We found that such testing—especially MMPI testing—would be valuable, since adherence to certain cutoff scores could appreciably lower the attrition rate among trainees. Lowered attrition would result in cost savings to the government and lessen unnecessary emotional trauma by sparing some candidates the stress of failure. The benefits of improved screening procedures will be increasingly important in tri-service psychiatric technician training programs.

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